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HUMAN ENGINEERING LAB ABERDEEN PROVING GROUND MD
A COMPUTER PROGRAM FOR ASSESSING READABILITY.(U)

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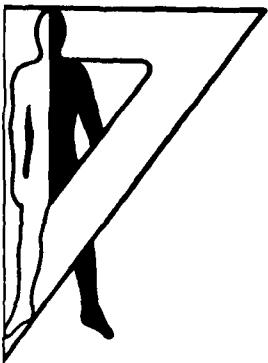
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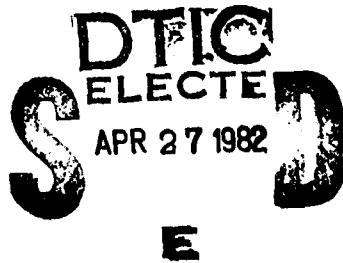
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A COMPUTER PROGRAM FOR ASSESSING READABILITY

Judah Katznelson

February 1980
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A computerized program for assessing the readability of technical documentation is presented. This program is particularly useful to Army personnel responsible for the readability of Army publications. The program is designed to provide the user with an analysis of the text that includes: (a) the complete text, (b) a listing of words containing 3 or more syllables and the number of times each multi-syllable word appears in the text, (c) the number of sentences, (d) the average sentence length, (e) the		
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20. ABSTRACT (Continued)

number of words, (f) the number of syllables, (g) the average syllables per word and (h) the Flesch-Kincaid reading grade level score. An appendix provides the reader with both a complete program listing (BASIC) and sample input and output files.

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A COMPUTER PROGRAM FOR ASSESSING READABILITY

Judah Katznelson



February 1980

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A COMPUTER PROGRAM FOR ASSESSING READABILITY

INTRODUCTION

Studies have shown that technical materials are written at a level of difficulty well above the reading ability of the personnel who must read those materials (Klare, 1963; Smith & Kincaid, 1970; Caylor, Sticht, Fox & Ford, 1973). Several studies have indicated that the average reading ability of enlisted personnel is about at the ninth grade level (Curran, 1977; Fletcher, 1977; U.S. Army Infantry School, 1978). Analyses have also found that technical manuals, training materials and government publications are often written at the college level or beyond causing a mismatch between the reading ability of the average serviceman and the readability of technical materials.

Various factors contribute to this problem; the complexity of modern weapons, the technical familiarity of the technical writer is greater than the user's familiarity with the system, and the average reading ability of servicemen has not kept pace with the rise in the level of complexity of the military systems they interact with and have responsibility for. When the readability mismatch exceeds 1-1 1/2 grade levels, serious inefficiencies result such as reduced reading speed, comprehension and retention.

Since it can be both impractical and costly to provide remedial reading courses for the average serviceman, another method must be used to solve the problem. It is not always an easy task to improve the readability of technical documents, but practical experience has shown that almost any document can be made more readable. The problem, of course, is to provide readable materials without a loss of content accuracy--a problem that can usually be solved.

It would be overly simplistic to lower the reading grade level of a document merely by using short words and short sentences. The readability of a document is only important to the extent that readability influences the useability of the document.

However, the comprehensibility of the document must also be taken into account. Contrary to the belief of some, a low reading grade level of a document does not ensure comprehensibility. Only if readability is understood to include good "style," a smooth flow of ideas, the avoidance of complex structures, interest appeal and usefulness can the document fulfill its purpose of information transfer and utilization. These factors plus the knowledge, reading skills and motivation of the intended audience interact with readability to provide an estimation of the useability of the document (Figure 1).

READABILITY + COMPREHENSIBILITY = USEABILITY

Figure 1. Useability formula.

Even though adequate methodology for measuring comprehensibility and useability has not been developed, it is important to keep in mind that readability is a necessary, but not a sufficient, condition for high quality publications. Future research may enable people to measure the comprehensibility and useability of publications. This report addresses only the readability factor.

READABILITY ASSESSMENT COMPUTER PROGRAM

The most common method for predicting the ease or difficulty of a given piece of material is the readability formula. A great many of these have been developed, with the majority using as variables some index of sentence length, sentence structure and individual word length as measured by the number of syllables.

Probably the most widely used of the readability formulas is that developed by Rudolph Flesch (1948). This formula--termed the Reading Ease (RE) formula--uses as variables the number of words per sentence and the number of syllables per 100-200 words of text. The RE formula was developed and validated on children and civilian adults, with reading material appropriate to these samples. Its usefulness for assessing the difficulty of military technical writing may therefore be suspect. In order to overcome this problem, Kincaid (1975) recalculated the formula using enlisted personnel reading job-relevant literature (Figure 2).

$$\begin{aligned} RGL &= .39 \text{ (average words per sentence)} \\ &+ 11.80 \text{ (average syllables per word)} \\ &- 15.59 \end{aligned}$$

Figure 2. Recalculated reading ease formula.

The recalculated Flesch formula is known as the Flesch-Kincaid Reading Grade Level Formula and has been approved for use in measuring the readability of Army publications (Military Specification MIL-M-38784A, Amendment #5; DA Circular 310-9; TRADOC Circular 351-6). Using this method, it

is possible to compute the level of readability of a publication. This reading level is expressed numerically as a reading grade level (RGL).¹

To apply the formula, the number of syllables, words and sentences in the passage being analyzed must be counted. For long passages, several 100-200 word samples are chosen to save time. The formula variables and score are computed. A prediction of how readable the piece of writing is likely to be for the intended readers is provided by the formula score. For example, if the grade level score is 12.3, but the intended readers average only 9th grade ability, the passage is likely to be too difficult. The writer may then rewrite the passage to suit the intended target population. Ideally, the formula should be reapplied after the rewrite to verify that the passage is at the appropriate level.

In the past, readability formulas were computed manually. As familiarity with computers increased, some users saw the automation of readability formulas as a more efficient method of analyzing readability. One such industrial computer program (4) appeared to offer the most promise in meeting the Army's needs. This program was rewritten slightly to include parameters of interest to the Army. (See Appendix A for a complete listing of the program.)

To use the computerized program for assessing readability, the user should do the following:

a. Create a computer file containing the document to be evaluated. If the document is large, several text sample files of 100-200 words may be randomly selected. The file(s) should be typed in upper case letters and saved in line numbered file(s). (See Appendix B, pages 19 and 20.)

b. Run the computer program.

The program will ask for the file name(s) one at a time. Simply type in a file name containing the sample to be scored. After the last file has been scored, type the word "summary" if one is desired or type the word "stop" if the preliminary printout is adequate (see Appendix B, page 18).

¹RGL is comparable to, but not equivalent to, school grade; it is a somewhat arbitrary level at which a particular grade student 'should' be able to read with satisfactory comprehension. RGLs should be used with care as they are only partial evidence of the difficulty of written material. RGLs measure sentence length and vocabulary (poly-syllables). They do not measure other equally important readability factors such as concepts, format, organization, interest appeal, and usefulness. Nor do they measure the knowledge, reading skills and motivation of the reader.

One feature of this program is the various kinds of information that are presented to the user. The program has a routine which calculates the average reading grade level of any number of passages (sample inputs) (see Appendix B). This feature is useful because Military Specification MIL-M-38783A requires that manuals be written at some particular average reading grade level. The output of the program shows the analyzed text and lists the words of three or more syllables in the order that those words occur in the text. This list is entitled "HI-CAL" (a short form of "high-calorie"), and a writer can use this long word list to identify quickly those parts of the text that are most likely to be difficult for the intended readers (see Appendix C). The "SUMMARY AND CALCULATIONS" portion of the printout lists the raw data, formula variables and the reading grade level according to the Flesch-Kincaid formula. Using this data, the author can tell at a glance if his writing is at an appropriate level and whether military specification requirements have been met (see Appendix D).

SUMMARY

Summarizing the area of prediction of readability, it seems clear that while text readability is a basic characteristic, comprehension must also be taken into account. Future research should be directed to determining which of the variables involved in the readability and comprehensibility area stand in causal relationships with the ability of persons to comprehend the written word.

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APPENDIX A

READABILITY ASSESSMENT PROGRAM LISTING

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READABILITY ASSESSMENT PROGRAM LISTING

```
READ
1000 GOSUB 7050
1025 PRINT" COMPUTERIZED READABILITY PROGRAM
1050 GOSUB 7075
1075 PRINT"DO YOU WANT INSTRUCTIONS (YES/NO)";
1100 INPUT A$
1125 IF A$="NO" THEN 1675
1150 IF A$="N" THEN 1675
1075 PRINT" THIS U.S. ARMY HUMAN ENGINEERING LABORATORY COMPUTER "
1200 PRINT" PROGRAM WILL BE RUN ON THE GSA HONEYWELL G440 TIME "
1225 PRINT" SHARE COMPUTER. IF YOU NEED ANY ASSISTANCE, PLEASE CALL"
1230 PRINT" COMMERCIAL 301-278-5538 OR AUTOVON 283-5538. "
1250 PRINT
1275 PRINT" INSTRUCTIONS"
1300 PRINT"THIS PROGRAM ACCEPTS SAMPLE INPUT FROM FILES AND SCORES THE"
1325 PRINT"READING GRADE LEVEL OF THE INPUT. TO USE THE PROGRAM, "
1330 PRINT"SIMPLY..."
1350 PRINT
1375 PRINT" 1) SELECT A TEXT SAMPLE SIZE OF ABOUT 100 WORDS OR MORE"
1400 PRINT" AND SAVE IN A LINE-NUMBERED FILE. (PLEASE TYPE ALL"
1425 PRINT" TEXT IN THE UPPER CASE.)"
1430 PRINT" NOTE: USE A SET OF APOSTROPHES ('.....') FOR"
1435 PRINT" QUOTATION PURPOSES. DO NOT USE QUOTATION MARKS IN"
1440 PRINT" YOUR TEXT SAMPLE."
1445 PRINT
1450 PRINT" 2) USE AS MANY FILES AS NEEDED TO SAMPLE ALL THE STYLES"
1475 PRINT" OF WRITING THAT MAY APPEAR IN THE MATERIAL BEING"
1480 PRINT" SCORED."
1500 PRINT
1525 PRINT" 3) THE PROGRAM WILL ASK FOR THE FILE NAME(S) ONE AT A"
1530 PRINT" TIME."
1550 PRINT
1575 PRINT" 4) AFTER THE LAST FILE HAS BEEN SCORED, TYPE IN 'SUMMARY'"
1600 PRINT" IF ONE IS DESIRED, OTHERWISE TYPE IN 'STOP'."
1605 PRINT
1610 PRINT" 5) WHEN YOU HAVE COMPLETED THE SCORING OF THE SAMPLE"
1615 PRINT" TEXTS AND HAVE NO FURTHER USE FOR THE FILE(S),"
1617 PRINT" UNSAVE THE FILE(S) YOU HAVE CREATED IN STEP #1."
1621 PRINT
1625 PRINT" YOU ARE NOW READY TO BEGIN."
1650 GOSUB 7075
1675 F=Q=G=E=0
1700 REM '*'=FILE TO BE NAMED. '**'=SCRATCH FILE.
1725 FILES *,SCRAT1,SCRAT2,SCRAT3
1750 DIM A(50),V(12),X$(1000),P(100),C(100),R(132),E(50)
1775 R2=0
1800 REM DECIMAL CODE FOR A,E,I,O,U,Y,D,T,E,S,Z,L
1825 V(1)=65
1850 V(2)=69
1875 V(3)=73
1900 V(4)=79
1925 V(5)=85
```

```
1950 V(6)=89
1975 V(7)=68
2000 V(8)=84
2025 V(9)=69
2050 V(10)=83
2075 V(11)=90
2100 V(12)=76
2125 SCRATCH #3
2150 REM END-OF-SENTENCE DELIMITERS
2175 A$=".?!:""
2200 CHANGE A$ TO P
2225 P1 = P(0)
2250 REM STRIP COMMAS
2275 A$=","
2300 CHANGE A$ TO C
2325 PRINT" TYPE IN A FILE NAME      (OR SUMMARY, OR STOP).";
2350 INPUT A$
2375 IF A$="STOP" THEN 7125
2400 IF A$="SUMMARY" THEN 6000
2425 FILE #1,A$
2450 SCRATCH #2
2475 SCRATCH #4
2500 GOSUB 7050
2525 REM PRINT TEXT
2550 PRINT"NAME OF SAMPLE TEXT:",A$,DAT$
2575 D$=A$
2600 GOSUB 7075
2625 PRINT"TEXT:"
2650 PRINT
2675 READ #1,A$
2700 PRINT A$
2725 REM R1 IS SIZE OF LINE R2 IS SIZE OF WORD
2750 REM BREAK SENTENCES INTO WORDS AND WRITE EACH AS RECORD IN NEW FILE
2775 CHANGE A$ TO R
2800 FOR R1 = 1 TO R(0)
2825 REM CHECK FOR END OF SENTENCE
2850 IF R1 = R(0) THEN 2900
2875 IF R(R1) <> 32 THEN 3200
2900 IF R2 = 0 THEN 3225
2925 IF R1 <> R(0) THEN 3000
2950 GOSUB 8050
2975 GO TO 3100
3000 FOR E1=1 TO R2
3025 E(E1) = R(E1 + (R1-(R2+1)))
3050 NEXT E1
3075 E(0) = R2
3100 CHANGE E TO E$
3125 R2 = 0
3150 PRINT #2,E$
3175 GO TO 3225
3200 R2 = R2 + 1
3225 NEXT R1
3250 IF MORE #1, THEN 2675
3275 GOSUB 7050
3300 PRINT"HI-CAL WORDS:"
3325 PRINT
```

```

3350 S=W=T=0
3375 RESTORE #2
3400 IF END #2, THEN 5525
3425 READ #2,A$
3450 W=W+1
3475 V=0
3500 REM ROUTINE FOR COUNTING SENTENCES, WORDS AND SYLLABLES
3525 CHANGE A$ TO A
3550 B=A(0)
3575 REM CHECK FOR TRAILING COMMA
3600 IF A(B) <> C(1) THEN 3700
3625 B=B-1
3650 GOTO 3875
3675 REM CHECK FOR END-OF-SENTENCE DELIMITER
3700 FOR I=1 TO P1
3725 IF A(B) <> P(I) THEN 3825
3750 S=S+1
3775 B=B-1
3800 GOTO 3875
3825 NEXT I
3850 REM COUNT ONE SYLLABLE IF WORD IS .LE. THREE CHARACTERS LONG
3875 IF B>3 THEN 3975
3900 V=1
3925 GOTO 5325
3950 REM CHECK FOR TRAILING 'E'
3975 IF A(B) <> V(2) THEN 4075
4000 B=B-1
4025 GOTO 4325
4050 REM CHECK FOR TRAILING 'S'
4075 IF A(B) <> V(10) THEN 4150
4100 B=B-1
4125 REM CHECK FOR 'E' BEFORE TRAILING 'S'
4150 IF A(B) <> V(9) THEN 4525
4175 B=B-1
4200 REM CHECK FOR 'E,S,Z OR L' BEFORE TRAILING 'ES'
4225 FOR I=9 TO 11
4250 IF A(B) = V(I) THEN 4850
4275 NEXT I
4300 REM CHECK FOR 'L' BEFORE TRAILING 'ES' OR 'ED'
4325 IF A(B) <> V(12) THEN 4875
4350 B=B-1
4375 REM CHECK FOR A VOWEL BEFORE TRAILING 'LES' OR 'LED'
4400 FOR I=1 TO 6
4425 IF A(B) = V(I) THEN 4850
4450 NEXT I
4475 GOTO 4800
4500 REM CHECK FOR TRAILING 'D'
4525 IF A(B) <> V(7) THEN 4875
4550 B=B-1
4575 REM CHECK FOR 'E' BEFORE TRAILING 'D'
4600 IF A(B) <> V(9) THEN 4875
4625 B=B-1
4650 REM CHECK FOR 'D,T OR E' BEFORE TRAILING 'ED'
4675 FOR I=7 TO 9
4700 IF A(B) = V(I) THEN 4850
4725 NEXT I

```

```

4750 GOTO 4325
4775 REM TRUNCATE '2' TRAILING LETTERS
4800 B=B+1
4825 REM TRUNCATE '1' TRAILING LETTER
4850 B=B+1
4875 L=0
4900 REM COUNT NUMBER OF SYLLABLES IN WORD
4925 REM THIS PROGRAM COUNTS EVERY NON-CONSECUTIVE VOWEL AS A SYLLABLE
4950 FOR I=1 TO B
4975 FOR J=1 TO 6
5000 IF A(I) <> V(J) THEN 5175
5025 IF I=1 THEN 5100
5050 M=I-L
5075 IF M=1 THEN 5125
5100 V=V+1
5125 L=I
5150 GOTO 5200
5175 NEXT J
5200 NEXT I
5225 REM MAKE SURE EVERY WORD HAS AT LEAST ONE SYLLABLE
5250 IF V>0 THEN 5325
5275 V=1
5300 REM SUM UP NUMBER OF SYLLABLES IN TEXT
5325 T=T+V
5350 IF V<3 THEN 5450
5375 A(0)=B
5400 CHANGE A TO A$
5425 PRINT #4,A$
5450 IF MORE #2, THEN 3400
5475 REM TEXT HAS BEEN ANALYZED ----- PRINT RESULTS
5500 GOSUB 7450
5525 GOSUB 7050
5550 PRINT "SUMMARY AND CALCULATIONS:"
5575 APPEND #3
5600 PRINT #3, USING 5625,D$,S,W,T
5625:'LLLLLLLL,###,#####.#,#####.#
5650 GOSUB 6875
5675 PRINT
5700 PRINT USING 5725,S,E
5725:* NUMBER OF SENTENCES=###.#      AVERAGE SENTENCE LENGTH=###.# *
5750 PRINT USING 5775,W,Q
5775:* NUMBER OF WORDS=###.#      AVERAGE SYLLABLES PER WORD=###.# *
5800 PRINT USING 5825,T,G
5825:* NUMBER OF SYLLABLES=###.#      FLESCH-KINCAID RGL=###.# *
5850 FILE #1,""
5875 GOSUB 7075
5900 PRINT
5925 GOTO 2325
5950 STOP
5975 REM SUMMARY OF ALL SAMPLE FILES
6000 RESTORE #3
6025 S=W=0
6050 IF END #3, THEN 6225
6075 INPUT #3,D$,S,W,T
6100 IF S=0 THEN 6225
6125 S1=S1+S

```

```

6150 W1=W1+W
6175 T1=T1+T
6200 GOTO 6050
6225 RESTORE #3
6250 APPEND #3
6275 PRINT #3, USING 6300,S1,W1,T1
6300:TOTAL ,####,#####.#,#####
6325 GOSUB 7075
6350 PRINT
6375 PRINT TAB(28); "SUMMARY OF DATA"
6400 PRINT
6425 PRINT TAB(37); "AVE." ;TAB(46) ;"SYL." ;TAB(53) ;"FLESCH"
6450 PRINT TAB(12S;"SENT-";TAB(28);"SYL-";TAB(37);"SENT";
6475 PRINT TAB(46); "PER";TAB(53); "KINCAID"
6500 PRINT "FILENAME";TAB(12); "ENCES";TAB(20); "WORDS";TAB(28);
6525 PRINT "TABLES";TAB(37); "LENGTH";TAB(46); "WORD";TAB(53); "RGL"
6550 GOSUB 7075
6575 RESTORE #3
6600 IF END #3, THEN 6775
6625 INPUT #3,D$,S,W,T
6650 IF S=0 THEN 6775
6675 GOSUB 6875
6700 PRINT USING 6725,D$,S,W,T,E,Q,G
6725 :'LLLLLLL  ###      ####      ####.#
6750 GOTO 6600
6775 GOSUB 7075
6800 STOP
6825 REM CALCULATION OF FLESCH READING EASE AND READING GRADE LEVEL
6850 REM CALCULATE WORDS PER SENTENCE
6875 E=W/S
6900 REM CALCULATE SYLLABLES PER WORD
6925 Q=T/W
6950 REM CALCULATE THE FLESCH-KINCAID RGL, STORE IN 'G'
6975 G=.39*E +11.8*Q -15.59
7000 RETURN
7025 REM           SUBROUTINE
7050 PRINT
7075 PRINT"-----"
7100 RETURN
7125 STOP
7150 REM SORT ROUTINE FOR HI-CAL WORDS
7175 J=0
7200 FOR K=1 TO N-1
7225 IF X$(K)<= X$(K+1) THEN 7350
7250 T$=X$(K)
7275 X$(K)=X$(K+1)
7300 X$(K+1)=T$
7325 J=1
7350 NEXT K
7375 IF J=1 THEN 7175
7400 RETURN
7425 REM READ IN JI-CAL WORDS THEN CALL SORT ROUTINE
7450 Z$="ZZZZZZ"
7475 PRINT #4,Z$
7500 RESTORE #4
7525 N=0

```

```
7550 N=N+1
7575 READ#4,X$(N)
7600 IF X$(N) < "ZZZZ" THEN 7550
7625 GOSUB 7150
7650 U1=0
7675 L=0
7700 FOR I=1 TO N-1
7725 U1=U1+1
7750 IF X$(I)=X$(I+1) THEN 7925
7775 IF X$(I)=" " THEN 7900
7800 REM PRINT SORTED HI-CAL WORDS AND NUMBER OF TIMES USED
7825 PRINT USING 7850,U1,X$(I);
7850 :###'LLLLLLLLLLLLLL
7875 GOSUB 8200
7900 U1=0
7925 NEXT I
7950 FOR I=1 TO N
7975 X$(I)=" "
8000 NEXT I
8025 RETURN
8050 REM END OF LINE ROUTINE
8075 FOR E1 = 1 TO R2+1
8100 E(E1) = R(E1 + (R1 - (R2+1)))
8125 NEXT E1
8150 E(0) = R2 + 1
8175 RETURN
8200 REM SUB TO PRINT ONLY 3 HI-CAL WORDS PER LINE
8225 L=L+1
8250 IF L<3 THEN 8325
8275 PRINT
8300 L=0
8325 RETURN
8350 END
```

APPENDIX B

INSTRUCTIONS AND SAMPLE INPUTS

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INSTRUCTIONS

READ

COMPUTERIZED READABILITY PROGRAM

DO YOU WANT INSTRUCTIONS (YES/NO) ? YES

THIS U.S. ARMY HUMAN ENGINEERING LABORATORY COMPUTER
PROGRAM WILL BE RUN ON THE GSA HONEYWELL G440 TIME
SHARE COMPUTER. IF YOU NEED ANY ASSISTANCE, PLEASE CALL
COMMERCIAL 301-278-5538 OR AUTOVON 283-5538.

INSTRUCTIONS

THIS PROGRAM ACCEPTS SAMPLE INPUT FROM FILES AND SCORES THE READING
GRADE LEVEL OF THE INPUT. TO USE THIS PROGRAM, SIMPLY...

- 1) SELECT A TEXT SAMPLE SIZE OF ABOUT 100 WORDS OR MORE AND SAVE IN
A LINE-NUMBERED FILE. (PLEASE TYPE ALL TEXT IN THE UPPER CASE.)
NOTE: USE A SET OF APOSTROPHES ('.....') FOR QUOTATION PURPOSES.
DO NOT USE QUOTATION MARKS IN YOUR TEXT SAMPLE.
- 2) USE AS MANY FILES AS NEEDED TO SAMPLE ALL THE STYLES
OF WRITING THAT MAY APPEAR IN THE MATERIAL BEING SCORED.
- 3) THE PROGRAM WILL ASK FOR THE FILE NAME(S) ONE AT A TIME.
- 4) AFTER THE LAST FILE HAS BEEN SCORED, TYPE IN 'SUMMARY'
IF ONE IS DESIRED, OTHERWISE TYPE IN 'STOP'.
- 5) WHEN YOU HAVE COMPLETED THE SCORING OF THE SAMPLE TEXTS AND
HAVE NO FURTHER USE FOR THE FILE(S), UNSAVE THE FILE(S) YOU
HAVE CREATED IN STEP #1.

YOU ARE NOW READY TO BEGIN.

TYPE IN A FILE (OR SUMMARY, OR STOP)?

THE NATIONAL ANTHEM - THE STAR-SPANGLED BANNER

FILE1

100 OH, SAY CAN YOU SEE BY THE DAWN'S EARLY LIGHT
105 WHAT SO PROUDLY WE HAILED AT THE TWILIGHT'S LAST GLEAMING?
110 WHOSE BROAD STRIPES AND BRIGHT STARS THROUGH THE PERILOUS FIGHT
115 O'ER THE RAMPARTS WE WATCHED WERE SO GALLANTLY STREAMING?
120 AND THE ROCKET'S RED GLARE, THE BOMBS BURSTING IN AIR
125 GAVE PROOF THROUGH THE NIGHT THAT OUR FLAG WAS STILL THERE.
130 OH, SAY DOES THAT STAR-SPANGLED BANNER YET WAVE
135 O'ER THE LAND OF THE FREE AND THE HOME OF THE BRAVE?

THE GETTYSBURG ADDRESS

FILE2

100 FOUR SCORE AND SEVEN YEARS AGO OUR FATHERS BROUGHT FORTH ON THIS
105 CONTINENT A NEW NATION, CONCEIVED IN LIBERTY AND DEDICATED TO THE
110 PROPOSITION THAT ALL MEN ARE CREATED EQUAL.

115 NOW WE ARE ENGAGED IN A GREAT CIVIL WAR, TESTING WHETHER THAT
120 NATION OR ANY NATION SO CONCEIVED AND SO DEDICATED CAN LONG ENDURE.
125 WE ARE MET ON A GREAT BATTLE FIELD OF THAT WAR. WE HAVE COME TO
130 DEDICATE A PORTION OF THAT FIELD, AS A FINAL RESTING PLACE FOR THOSE
135 WHO HERE GAVE THEIR LIVES THAT THAT NATION MIGHT LIVE. IT IS
140 ALTOGETHER FITTING AND PROPER THAT WE SHOULD DO THIS.

145 BUT, IN A LARGER SENSE, WE CAN NOT DEDICATE - WE CAN NOT
150 CONSECRATE - WE CAN NOT HOLLOW - THIS GROUND. THE BRAVE MEN, LIVING
155 AND DEAD, WHO STRUGGLED HERE, HAVE CONSECRATED IT, FAR ABOVE OUR
160 POOR POWER TO ADD OR DETRACT. THE WORLD WILL LITTLE NOTE, NOR LONG
165 REMEMBER, WHAT WE SAY HERE, BUT IT CAN NEVER FORGET WHAT THEY DID
170 HERE. IT IS FOR US THE LIVING, RATHER, TO BE DEDICATED HERE TO THE
175 UNFINISHED WORK WHICH THEY WHO FOUGHT HERE HAVE THUS FAR SO NOBLY
180 ADVANCED. IT IS RATHER FOR US TO BE HERE DEDICATED TO THE GREAT
185 TASK REMAINING BEFORE US - THAT FROM THESE HONORED DEAD WE TAKE
190 INCREASED DEVOTION TO THAT CAUSE FOR WHICH THEY GAVE THE LAST FULL
195 MEASURE OF DEVOTION - THAT WE HERE HIGHLY RESOLVE THAT THESE DEAD
200 SHALL NOT HAVE DIED IN VAIN - THAT THIS NATION, UNDER GOD, SHALL
205 HAVE A NEW BIRTH OF FREEDOM - AND THAT GOVERNMENT OF THE PEOPLE,
210 BY THE PEOPLE, FOR THE PEOPLE, SHALL NOT PERISH FROM THE EARTH.

APPENDIX C

SAMPLE PRINTOUTS

NAME OF SAMPLE TEXT: FILE1

TEXT:

OH

SAY CAN YOU SEE BY THE DAWN'S EARLY LIGHT
WHAT SO PROUDLY WE HAILED AT THE TWILIGHT'S LAST GLEAMING?
WHOSE BROAD STRIPES AND BRIGHT STARS THROUGH THE PERILOUS FIGHT
O'ER THE RAMPARTS WE WATCHED WERE SO GALLANTLY STREAMING?
AND THE ROCKET'S RED GLARE
THE BOMBS BURSTING IN AIR
GAVE PROOF THROUGH THE NIGHT THAT OUR FLAG WAS STILL THERE.

OH

SAY DOES THAT STAR-SPANGLED BANNER YET WAVE
O'ER THE LAND OF THE FREE AND THE HOME OF THE BRAVE?

HI-CAL WORDS:

1 GALLANTLY

1 PERILOU

1 STAR-SPANGLE

SUMMARY AND CALCULATIONS:

* NUMBER OF SENTENCES=	4.0	AVERAGE SENTENCE LENGTH=	20.0	*
* NUMBER OF WORDS=	80.0	AVERAGE SYLLABLES PER WORD=	1.2	*
* NUMBER OF SYLLABLES=	97.0	FLESCH-KINCAID RGL=	6.5	*

NAME OF SAMPLE TEXT: FILE2

TEXT:

FOUR SCORE AND SEVEN YEARS AGO OUR FATHERS BROUGHT FORTH ON THIS
CONTINENT A NEW NATION
CONCEIVED IN LIBERTY AND DEDICATED TO THE
PROPOSITION THAT ALL MEN ARE CREATED EQUAL.
NOW WE ARE ENGAGED IN A GREAT CIVIL WAR
TESTING WHETHER THAT
NATION OR ANY NATION SO CONCEIVED AND SO DEDICATED CAN LONG ENDURE.
WE ARE MET ON A GREAT BATTLE FIELD OF THAT WAR. WE HAVE COME TO
DEDICATE A PORTION OF THAT FIELD
AS A FINAL RESTING PLACE FOR THOSE
WHO HERE GAVE THEIR LIVES THAT THAT NATION MIGHT LIVE. IT IS
ALTOGETHER FITTING AND PROPER THAT WE SHOULD DO THIS.
BUT
IN A LARGER SENSE
WE CAN NOT DEDICATE - WE CAN NOT
CONSECRATE - WE CAN NOT HOLLOW - THIS GROUND. THE BRAVE MEN
LIVING
AND DEAD
WHO STRUGGLED HERE
HAVE CONSECRATED IT
FAR ABOVE OUR
POOR POWER TO ADD OR DETRACT. THE WORLD WILL LITTLE NOTE
NOR LONG
REMEMBER
WHAT WE SAY HERE
BUT IT CAN NEVER FORGET WHAT THEY DID
HERE. IT IS FOR US THE LIVING
RATHER
TO BE DEDICATED HERE TO THE
UNFINISHED WORK WHICH THEY WHO FOUGHT HERE HAVE THUS FAR SO NOBLY
ADVANCED. IT IS RATHER FOR US TO BE HERE DEDICATED TO THE GREAT
TASK REMAINING BEFORE US - THAT FROM THESE HONORED DEAD WE TAKE
INCREASED DEVOTION TO THAT CAUSE FOR WHICH THEY GAVE THE LAST FULL
MEASURE OF DEVOTION - THAT WE HERE HIGHLY RESOLVE THAT THESE DEAD
SHALL NOT HAVE DIED IN VAIN - THAT THIS NATION
UNDER GOD
SHALL
HAVE A NEW BIRTH OF FREEDOM - AND THAT GOVERNMENT OF THE PEOPLE
BY THE PEOPLE
FOR THE PEOPLE
SHALL NOT PERISH FROM THE EARTH.

HI-CAL WORDS:

1 ALTOGETHER	1 CONSECRAT	1 CONSECRATE
1 CONTINENT	2 DEDICAT	3 DEDICATE
1 DELICTE	2 DEVOTION	1 GOVERNMENT

1 LIBERTY
1 REMEMBER

1 PROPOSITION
1 UNFINISH

1 REMAINING

SUMMARY AND CALCULATIONS:

* NUMBER OF SENTENCES= 10.0 AVERAGE SENTENCE LENGTH= 27.9 *
* NUMBER OF WORDS= 279.0 AVERAGE SYLLABLES PER WORD= 1.3 *
* NUMBER OF SYLLABLES= 370.0 FLESCH-KINCAID RGL= 10.9 *

APPENDIX D

COMPARISONS OF SIMILAR SAMPLE TEXTS

TECHNICAL SAMPLE INPUT BEFORE REWRITE

FILE3

100 TO TEST THE ZERO SETTING (END-FOR-END TEST) OF THE GUNNER'S QUADRANT
105 PROCEED AS FOLLOWS:

110 A) SET BOTH THE INDEX ARM AND THE MICROMETER SCALE AT ZERO.
115 B) PLACE THE QUADRANT ON THE QUADRANT SEATS OF THE BREECH RING
120 WITH THE BLACK 'LINE OF FIRE' ARROW POINTED TOWARDS THE
125 MUZZLE. CENTER THE BUBBLE BY ELEVATING OR DEPRESSING THE GUN.
130 C) TURN THE QUADRANT END-FOR-END. IF THE BUBBLE RECENTERS ITSELF,
135 THE QUADRANT IS IN PERFECT ADJUSTMENT. IF THE BUBBLE DOES NOT
140 RECENTER ITSELF, TRY TO CENTER THE BUBBLE BY TURNING THE
145 MICROMETER KNOB.
150 D) IF THE BUBBLE RECENTERS, THE CORRECTION IS PLUS(POSITIVE) AND
155 EQUAL TO ONE-HALF THE MICROMETER READING. SET THIS ADJUSTED
160 READING ON THE MICROMETER SCALE; CENTER BUBBLE BY ELEVATING
165 THE GUN; VERIFY CORRECTION BY TURNING QUADRANT END-FOR-END.
170 WHEN LAYING THE GUN TO A GIVEN ELEVATION, ADD THE CORRECTION
175 TO THE GIVEN ANGLE. WHEN MEASURING EXISTING ELEVATION ANGLES,
180 SUBTRACT THE CORRECTION FROM THE MICROMETER KNOB READING.
185 E) IF THE BUBBLE DOES NOT RECENTER WHEN THE MICROMETER IS TURNED,
190 THE CORRECTION IS MINUS(NEGATIVE). THE AMOUNT OF CORRECTION IS
195 DETERMINED AS FOLLOWS: DROP THE ELEVATION INDEX TO -10 (ONE
200 NOTCH BELOW ZERO); ROTATE THE MICROMETER KNOB UNTIL THE BUBBLE
205 IS CENTERED BELOW ZERO; SUBTRACT THE MICROMETER READING FROM
210 10, AND DIVIDE THE REMAINDER BY 2. SET THIS ADJUSTED READING
215 ON THE MICROMETER SCALE; CENTER BUBBLE BY DEPRESSING GUN; TURN
220 QUADRANT END-FOR-END TO VERIFY. WHEN LAYING THE GUN TO A GIVEN
225 ELEVATION, SUBTRACT THE CORRECTION FROM THE GIVEN ELEVATION
230 ANGLE. IN THE EVENT THE REMAINDER THUS OBTAINED IS LESS THAN
235 ZERO, DROP THE INDEX TO -10; SUBTRACT THIS REMAINDER FROM 10
240 AND INDEX THE RESULTANT ANGLE ON THE MICROMETER. WHEN MEASURING
245 AN EXISTING ELEVATION ANGLE, ADD THE CORRECTION TO THE MICRO-
250 METER READING.
255 F) IF THE REQUIRED CORRECTION EXCEEDS 4/10THS, NOTIFY
260 ORGANIZATIONAL MAINTENANCE PERSONNEL.

NAME OF SAMPLE TEXT: FILE3

TEXT:

TO TEST THE ZERO SETTING (END-FOR-END TEST) OF THE GUNNER'S QUADRANT PROCEED AS FOLLOWS:

A) SET BOTH THE INDEX ARM AND THE MICROMETER SCALE AT ZERO.
B) PLACE THE QUADRANT ON THE QUADRANT SEATS OF THE BREECH RING WITH THE BLACK 'LINE OF FIRE' ARROW POINTED TOWARDS THE MUZZLE. CENTER THE BUBBLE BY ELEVATING OR DEPRESSING THE GUN.
C) TURN THE QUADRANT END-FOR-END. IF THE BUBBLE RECENTERS ITSELF THE QUADRANT IS IN PERFECT ADJUSTMENT. IF THE BUBBLE DOES NOT RECENTER ITSELF TRY TO CENTER THE BUBBLE BY TURNING THE MICROMETER KNOB.

D) IF THE BUBBLE RECENTERS THE CORRECTION IS PLUS(POSITIVE) AND EQUAL TO ONE-HALF THE MICROMETER READING. SET THIS ADJUSTED READING ON THE MICROMETER SCALE; CENTER BUBBLE BY ELEVATING THE GUN; VERIFY CORRECTION BY TURNING QUADRANT END-FOR-END. WHEN LAYING THE GUN TO A GIVEN ELEVATION

ADD THE CORRECTION TO THE GIVEN ANGLE. WHEN MEASURING EXISTING ELEVATION ANGLES SUBTRACT THE CORRECTION FROM THE MICROMETER KNOB READING.

E) IF THE BUBBLE DOES NOT RECENTER WHEN THE MICROMETER IS TURNED THE CORRECTION IS MINUS(NEGATIVE). THE AMOUNT OF CORRECTION IS DETERMINED AS FOLLOWS: DROP THE ELEVATION INDEX TO -10 (ONE NOTCH BELOW ZERO); ROTATE THE MICROMETER KNOB UNTIL THE BUBBLE IS CENTERED BELOW ZERO; SUBTRACT THE MICROMETER READING FROM 10

AND DIVIDE THE REMAINDER BY 2. SET THIS ADJUSTED READING ON THE MICROMETER SCALE; CENTER BUBBLE BY DEPRESSING GUN; TURN QUADRANT END-FOR-END TO VERIFY. WHEN LAYING THE GUN TO A GIVEN ELEVATION

SUBTRACT THE CORRECTION FROM THE GIVEN ELEVATION ANGLE. IN THE EVENT THE REMAINDER THUS OBTAINED IS LESS THAN ZERO

DROP THE INDEX TO -10; SUBTRACT THIS REMAINDER FROM 10 AND INDEX THE RESULTANT ANGLE ON THE MICROMETER. WHEN MEASURING AN EXISTING ELEVATION ANGLE ADD THE CORRECTION TO THE MICROMETER READING.

F) IF THE REQUIRED CORRECTION EXCEEDS 4/10THS NOTIFY ORGANIZATIONAL MAINTENANCE PERSONNEL.

HI-CAL WORDS:

1 (END-FOR-EN	2 ADJUSTE	1 ADJUSTMENT
9 CORRECTION	2 DEPRESSING	1 DETERMIN
2 ELEVATING	6 ELEVATION	3 END-FOR-EN

2	EXISTING	1	MAINTENANC	2	MEASURING
10	MICROMETER	1	MINUS (NEGATIVE)	1	NOTIFY
1	ONE-HALF	1	ORGANIZATIONAL	1	PERSONNEL
1	PLUS (POSITIVE)	4	RECENTER	3	REMAINDER
1	RESULTANT	2	VERIFY		

SUMMARY AND CALCULATIONS:

* NUMBER OF SENTENCES=	26.0	AVERAGE SENTENCE LENGTH=	11.5 *
* NUMBER OF WORDS=	298.0	AVERAGE SYLLABLES PER WORD=	1.7 *
* NUMBER OF SYLLABLES=	517.0	FLESCH-KINCAID RGL=	9.4 *

TECHNICAL SAMPLE INPUT AFTER REWRITE

FILE4

100 TO TEST THE ZERO SETTING FOR THE GUNNER'S QUADRANT, JUST:
105 A) POINT QUADRANT AT MUZZLE.
110 B) DEPRESS OR ELEVATE TUBE TO CENTER BUBBLE.
115 C) REVERSE DIRECTION.
120 D) IF THE BUBBLE CENTERS, THE TEST IS COMPLETE.
125 E) IF THE BUBBLE DOES NOT CENTER, CENTER THE BUBBLE WITH
130 MICROMETER KNOB.
135 F) IF THE BUBBLE CENTERS, DIVIDE THE MICROMETER READING BY 2.
140 G) PUT THE RESULTS ON THE MICROMETER SCALE.
145 H) POINT QUADRANT AT MUZZLE.
150 I) DEPRESS OR ELEVATE TUBE TO CENTER BUBBLE.
155 J) REVERSE DIRECTION.
160 K) BUBBLE IS CENTERED AND END-FOR-END CORRECTION IS RECORDED.
165 L) IF THE BUBBLE DOES NOT CENTER AFTER STEP 'E', THEN SET THE INDEX
170 AT -10.
175 M) CENTER THE BUBBLE WITH THE MICROMETER KNOB.
180 N) ADD 10 TO MICROMETER READING.
185 O) DIVIDE THIS SUM BY 2.
190 P) PLACE ANSWER ON MICROMETER SCALE.
195 Q) POINT QUADRANT AT MUZZLE.
200 R) DEPRESS OR ELEVATE TUBE TO CENTER BUBBLE.
205 S) REVERSE DIRECTION.
210 T) BUBBLE SHOULD CENTER.
215 U) SUBTRACT MICROMETER READING FROM 10.
220 V) RECORD END-FOR-END CORRECTION.

NAME OF SAMPLE TEXT: FILE4

TEXT:

TO TEST THE ZERO SETTING FOR THE GUNNER'S QUADRANT
JUST:
A) POINT QUADRANT AT MUZZLE.
B) DEPRESS OR ELEVATE TUBE TO CENTER BUBBLE.
C) REVERSE DIRECTION.
D) IF THE BUBBLE CENTERS
THE TEST IS COMPLETE.
E) IF THE BUBBLE DOES NOT CENTER
CENTER THE BUBBLE WITH
MICROMETER KNOB.
F) IF THE BUBBLE CENTERS
DIVIDE THE MICROMETER READING BY 2.
G) PUT THE RESULTS ON THE MICROMETER SCALE.
H) POINT QUADRANT AT MUZZLE.
I) DEPRESS OR ELEVATE TUBE TO CENTER BUBBLE.
J) REVERSE DIRECTION.
K) BUBBLE IS CENTERED AND END-FOR-END CORRECTION IS RECORDED.
L) IF THE BUBBLE DOES NOT CENTER AFTER STEP 'E'
THEN SET THE INDEX
AT -10.
M) CENTER THE BUBBLE WITH THE MICROMETER KNOB.
N) ADD 10 TO MICROMETER READING.
O) DIVIDE THIS SUM BY 2.
P) PLACE ANSWER ON MICROMETER SCALE.
Q) POINT QUADRANT AT MUZZLE.
R) DEPRESS OR ELEVATE TUBE TO CENTER BUBBLE.
S) REVERSE DIRECTION.
T) BUBBLE SHOULD CENTER.
U) SUBTRACT MICROMETER READING FROM 10.
V) RECORD END-FOR-END CORRECTION.

HI-CAL WORDS:

2 CORRECTION	3 DIRECTION	3 ELEVAT
2 END-FOR-EN	7 MICROMETER	1 RECORDE

SUMMARY AND CALCULATIONS:

* NUMBER OF SENTENCES= 23.0	AVERAGE SENTENCE LENGTH= 7.1 *
* NUMBER OF WORDS= 163.0	AVERAGE SYLLABLES PER WORD= 1.6 *
* NUMBER OF SYLLABLES= 256.0	FLESCH-KINCAID RGL= 5.7 *

NON-TECHNICAL SAMPLE INPUT BEFORE REWRITE

FILE5

100 OBJECTIVES.

105 THE OBJECTIVES OF THE ROTC PROGRAM ARE TO ATTRACT, MOTIVATE,
110 AND PREPARE SELECTED STUDENTS WITH POTENTIAL TO SERVE AS COMMISSIONED
115 OFFICERS IN THE REGULAR ARMY OR THE US ARMY RESERVE, TO PROVIDE AN
120 UNDERSTANDING OF THE FUNDAMENTAL PRINCIPLES OF MILITARY ART AND
125 SCIENCE AND TO DEVELOPE LEADERSHIP AND MANAGERIAL POTENTIAL, A BASIC
130 UNDERSTANDING OF ASSOCIATED PROFESSIONAL KNOWLEDGE, A STRONG
135 SENSE OF PERSONAL INTEGRITY, HONOR, AND INDIVIDUAL RESPONSIBILITY,
140 AND AN APPRECIATION OF THE REQUIREMENTS FOR NATIONAL SECURITY.
145 ATTAINMENT OF THESE OBJECTIVES WILL PREPARE STUDENTS FOR
150 COMMISSIONING AND WILL ESTABLISH A SOUND BASIS FOR THEIR FUTURE
155 PROFESSIONAL DEVELOPMENT AND EFFECTIVE PERFORMANCE IN THE ARMY.

NAME OF SAMPLE TEXT: FILE5

TEXT:

OBJECTIVES.

THE OBJECTIVES OF THE ROTC PROGRAM ARE TO ATTRACT
MOTIVATE

AND PREPARE SELECTED STUDENTS WITH POTENTIAL TO SERVE AS COMMISSIONED
OFFICERS IN THE REGULAR ARMY OR THE US ARMY RESERVE

TO PROVIDE AN

UNDERSTANDING OF THE FUNDAMENTAL PRINCIPLES OF MILITARY ART AND SCIENCE
AND TO DEVELOPE LEADERSHIP AND MANAGERIAL POTENTIAL

A BASIC

UNDERSTANDING OF ASSOCIATED PROFESSIONAL KNOWLEDGE

A STRONG

SENSE OF PERSONAL INTEGRITY

HONOR

AND INDIVIDUAL RESPONSIBILITY

AND AN APPRECIATION OF THE REQUIREMENTS FOR NATIONAL SECURITY.

ATTAINMENT OF THESE OBJECTIVES WILL PREPARE STUDENTS FOR
COMMISSIONING AND WILL ESTABLISH A SOUND BASIS FOR THEIR FUTURE
PROFESSIONAL DEVELOPMENT AND EFFECTIVE PERFORMANCE IN THE ARMY.

HI-CAL WORDS:

1 APPRECIATION	1 ASSOCIATE	1 ATTAINMENT
1 COMMISSION	1 COMMISSIONING	1 DEVELOP
1 DEVELOPMENT	1 EFFECTIV	1 ESTABLISH
1 FUNDAMENTAL	1 INDIVIDUAL	1 INTEGRITY
1 LEADERSHIP	1 MANAGERIAL	1 MILITARY
1 MOTIVAT	1 NATIONAL	3 OBJECTIV
1 OFFICER	1 PERFORMANC	1 PERSONAL
2 POTENTIAL	1 PRINCIPLE	2 PROFESSIONAL
1 REGULAR	1 REQUIREMENT	1 RESPONSIBILITY
1 SECURITY	1 SELECTE	2 UNDERSTANDING

SUMMARY AND CALCULATIONS:

* NUMBER OF SENTENCES= 3.0 AVERAGE SENTENCE LENGTH= 34.3 *
* NUMBER OF WORDS= 103.0 AVERAGE SYLLABLES PER WORD= 2.0 *
* NUMBER OF SYLLABLES= 207.0 FLESCH-KINCAID RGL= 21.5 *

NON-TECHNICAL SAMPLE INPUT AFTER REWRITE

FILE6

100 OBJECTIVES.

105 THE OBJECTIVES OF THE ROTC PROGRAM ARE TO:

110 A) ATTRACT, MOTIVATE, AND PREPARE STUDENTS WITH POTENTIAL TO
115 SERVE AS COMMISSIONED OFFICERS IN THE REGULAR ARMY OR THE
120 US ARMY RESERVE.

125 B) UNDERSTAND THE CONCEPTS AND PRINCIPLES OF MILITARY ART
130 AND SCIENCE.

135 C) DEVELOPE POTENTIAL TO LEAD AND MANAGE.

140 D) UNDERSTAND OTHER PROFESSIONS.

145 E) DEVELOPE INTEGRITY, HONOR, AND RESPONSIBILITY.

150 F) APPRECIATE THE NEED FOR NATIONAL SECURITY.

155 ATTAINING THESE OBJECTIVES PREPARES STUDENTS FOR COMMISSIONS
160 AND ESTABLISHES A BASIS FOR FUTURE PROFESSIONAL DEVELOPMENT AND
165 PERFORMANCE IN THE ARMY.

NAME OF SAMPLE TEXT: FILE6

TEXT:

OBJECTIVES.

THE OBJECTIVES OF THE ROTC PROGRAM ARE TO:

A) ATTRACT
MOTIVATE

AND PREPARE STUDENTS WITH POTENTIAL TO
SERVE AS COMMISSIONED OFFICERS IN THE REGULAR ARMY OR THE
US ARMY RESERVE.

B) UNDERSTAND THE CONCEPTS AND PRINCIPLES OF MILITARY ART
AND SCIENCE.

C) DEVELOPE POTENTIAL TO LEAD AND MANAGE.
D) UNDERSTAND OTHER PROFESSIONS.

E) DEVELOPE INTEGRITY

HONOR

AND RESPONSIBILITY.

F) APPRECIATE THE NEED FOR NATIONAL SECURITY.

ATTAINING THESE OBJECTIVES PREPARES STUDENTS FOR COMMISSIONS
AND ESTABLISHES A BASIS FOR FUTURE PROFESSIONAL DEVELOPMENT AND
PERFORMANCE IN THE ARMY.

HI-CAL WORDS:

1 APPRECIAT	1 ATTAINING	2 COMMISSION
2 DEVELOP	1 DEVELOPMENT	1 ESTABLISH
1 INTEGRITY	1 MILITARY	1 MOTIVAT
1 NATIONAL	3 OBJECTIV	1 OFFICER
1 PERFORMANC	2 POTENTIAL	1 PRINCIPLE
1 PROFESSION	1 PROFESSIONAL	1 REGULAR
1 RESPONSIBILITY	1 SECURITY	2 UNDERSTAN

SUMMARY AND CALCULATIONS:

* NUMBER OF SENTENCES= 9.0 AVERAGE SENTENCE LENGTH= 9.6 *
* NUMBER OF WORDS= 86.0 AVERAGE SYLLABLES PER WORD= 1.9 *
* NUMBER OF SYLLABLES= 164.0 FLESCH-KINCAID RGL= 10.6 *

COMPARATIVE SUMMARY

SUMMARY OF DATA

FILENAME	SENT- ENCES	WORDS	SYL- LABLES	AVE. SENT LENGTH	SYL. PER WORD	FLESCH KINCAID RGL
FILE1	4	80	97	20.0	1.2	6.5
FILE2	10	279	370	27.9	1.3	10.9
FILE3	26	298	517	11.5	1.7	9.4
FILE4	23	163	256	7.1	1.6	5.7
FILE5	3	103	207	34.3	2.0	21.5
FILE6	9	86	164	9.6	1.9	10.6
TOTAL	75	1009	1611	13.5	1.6	8.5

